ARI Research Note 2008-04

List of U.S. Army Research Institute Research and Technical Publications for Public Release/Unlimited Distribution

Fiscal Year 2007
October 1, 2006 to September 30, 2007
With Author Index and Report Titles and Subject Terms Index

United States Army Research Institute
for the Behavioral and Social Sciences

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**U.S. Army Research Institute
for the Behavioral and Social Sciences**

**A Directorate of the Department of the Army
Deputy Chief of Staff, G1**

Authorized and approved for distribution:

**MICHELLE SAMS, PhD.
Director**

Technical Review by

Karl Knoblauch, U.S. Army Research Institute

Foreword

The means of dissemination of the results of the U.S. Army Research Institute for the Behavioral and Social Sciences' (ARI) research and development/studies and analysis program vary widely depending on the type of work, the subject matter, and the sponsor/proponent. Typically, major findings with immediate policy and procedural implications are briefed to sponsors and proponents in order to enable timely implementation. This is followed up with complete documentation in the form of research and technical publications such as the ones listed here. In many cases, these documents represent the actual item handed off to the sponsor/proponent; this is particularly true of the Research Product category. In other cases, results are published in order to provide a complete record of the work done, and for future reference by researchers doing work in the same or similar areas.

This annotated list for FY 2007 provides an idea of both the depth and scope of the ARI research effort, and is a valuable resource for anyone interested in military psychology from either a scientific or operational perspective.

MICHELLE SAMS, PhD.
Director

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Introduction

The primary responsibility of the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) is to maximize Soldier effectiveness. ARI accomplishes its mission through research and development in the acquisition, training, utilization, and retention of Army personnel. ARI research and products affect every Army mission with a human performance component.

As convenient references for qualified agencies and individuals and sponsors, ARI publishes lists of its technical and research publications. This issue of the publication list describes reports published during the period October 1, 2006, to September 30, 2007. It contains the abstract of each publication and the bibliographic information needed to identify a publication. The abstracts have been written, as far as possible, to describe the principal research findings in non-technical terms; however, technical language is used to communicate efficiently the details of research analysis. Author and subject indexing provide access to individual reports and topics.

ARI Publications

ARI publications are divided into separate, consecutively numbered categories appropriate to their intended audience and function. During fiscal year 2007, the following types of research and technical reports were issued by ARI:

Technical Report (TR). A report of completed research intended primarily for dissemination to researchers.

Research Reports and Technical Reports published by the U.S. Army Research Institute for the Behavioral and Social Sciences are intended for sponsors of research and development (R&D) tasks and for other research and military agencies. Any findings ready for implementation at the time of publication are presented in the last part of the Executive Summary. Upon completion of a major phase of the task, formal recommendations for official action normally are conveyed to appropriate military agencies by briefing or memorandum.

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Research Report (RR). A report of completed research intended primarily for dissemination to military managers. Research Reports may deal with policy-related issues but typically do not include specific policy recommendations.

Research Product (RP). A user-oriented report intended to aid Army personnel. Examples are handbooks, manuals, and guidebooks.

Special Report (S). A published report on a topic of special interest or in-house research intended primarily for dissemination to a select audience.

Study Report (SR). A published report briefly documenting studies and analyses.

Study Note (SN). A Study Note may contain or consist of technical text, computer code, diskettes or tapes with software, databases, codebooks or other documentation, raw data, data collection instruments, figures, tables, or any other products that do not concisely convey the import of a project but which must be archived for technical completeness.

Research Note (RN). An interim, or final report typically of limited interest outside of ARI. It is filed with the Defense Technical Information Center (DTIC) but is not printed. Research Notes usually fall into one of the following categories:

- An in-house report that is of limited interest outside of ARI but is considered worth submitting to DTIC to be part of the Department of Defense (DoD) archive of technical documentation.

- An interim contract report that is of limited interest outside of ARI but is considered worth submitting to DTIC to be part of the DoD archive of technical documentation.

- A final contract report that is of limited interest outside of ARI but must be submitted to DTIC in accordance with Department of the Army regulations to close a contract.

- Material related to a Research Report or Technical Report (detailed tables, graphs, charts, sample forms, and sample training and testing materials) published as a Research Note to economize on printing and distribution.

Contractor Report (CR). An interim, or final report by a contractor that meets contractual obligations but is not defined by the other report categories.

ARI Distribution

Initial distribution of these publications is made directly by ARI. Research Reports, Technical Reports, Study Reports, and Research Products are distributed primarily to operational and research facilities and their sponsors in DoD, to other interested

Government agencies, and to DTIC; copies of some reports are also sent to libraries participating in the Documents Expediting Project. Research Notes, Study Notes, and Contractor Reports are filed with DTIC but are not published.

These publications are NOT available from ARI. DoD agencies and contractors can purchase paper copies or microfiche from:

Defense Logistics Agency
Defense Technical Information Center
8725 John J. Kingman Road, Suite 0944
Ft. Belvoir, VA 22060-6218
(703) 767-9030 or DSN 284-9030

Other Government agencies and the general public can obtain unclassified reports from:

U.S. Department of Commerce
National Technical Information Service
5285 Port Royal Road
Springfield, VA 22161
(703) 487-4650

NOTE: When requesting copies of these reports, use the DTIC accession number (AD - - - - - -) appearing in parentheses following the date of publication of each citation.

Technical Reports

TR 1190
Pre- to Middeployment Assessment of Unit Focused Stability Impact on Cohesion
Monte D. Smith & Joseph D. Hagman. October 2006. (ADA458762)

This third in a planned series of reports on research with U.S. Army Alaska's 172d Stryker Brigade Combat Team (SBCT) sought to (a) assess the impact of heightened personnel stability (under Unit Focused Stability [UFS] manning) on cohesion, and (b) identify factors that enhance or detract from (are predictive of) this impact over the 6-month interval between unit pre- and middeployment. The same 669 Soldiers from platoons organic to three infantry battalions, one field artillery battalion, and one cavalry squadron completed paper-and-pencil questionnaires at the end of garrison-based predeployment and again midway through overseas deployment. Results revealed that horizontal (Soldier to Soldier) cohesion remained unchanged, whereas vertical (Soldier to leader) and organizational (Soldier to unit/Army) cohesion dropped from pre- to middeployment. Leader effectiveness and learning environment were the best predictors of cohesion, especially vertical and organizational cohesion. Efforts to stabilize personnel under UFS during predeployment were perceived to have a positive (albeit limited) impact on cohesion, performance, morale, and unit commitment, with performance being the primary beneficiary. JRTC-based training during predeployment was also perceived to enhance middeployment individual and collective performance. Results were interpreted to suggest that (a) heightened UFS-imposed personnel stability will not by itself increase cohesion from pre- to middeployment, and (b) without a concerted effort to promote effective leadership and a positive learning environment for Soldiers, horizontal cohesion is unlikely to change from pre- to middeployment, whereas vertical and organizational cohesion is likely to drop. Findings also suggest that personnel stability, as well as JRTC-based training, during predeployment are both likely to benefit individual and collective performance during the first 6 months of deployment.

TR 1191
Web-Enabled Training-Development Tool for Pre-Deployment and Deployed Training
Anna T. Cianciolo. November 2006. (ADA458761)

Advanced training-development processes are required to enable the rapid generation of training activities that are responsive to immediate training need. The purpose of the present Phase I Small-Business Technology Transfer (STTR) effort was to explore the design and implementation of a web-enabled "training assistant" (TA) that supports the rapid generation of contextualized training activities. To conduct the Phase I research and development, GIST and Human Resources Research Organization (HumRRO) researched the Army training process, identified methods for relieving the constraints on rapid, contextualized training development, and developed these methods into a prototype TA capability for feasibility analysis. The Phase II TA as envisioned has great potential for saving time, increasing productivity, and improving training. However, implementing the full-scale concept capability cannot feasibly be

accomplished in the Phase II effort. The most feasible, influential, and immediately usable Phase II implementation of the TA concept should focus on supporting junior officers in the development of training activities not supported currently by doctrine, especially the decision-making exercise.

TR 1192
Predictors of Attrition in the Finnish Conscript Service
Mikael Salo & Guy L. Siebold . November 2006. (ADA460548)

This report describes attrition in the Finnish conscript service and identifies variables that predict attrition and their relative strength as determined by various statistical models. Subjects were 2,003 conscripts, 211 of which were separated before completing their six-month military obligation. The categories of predictors considered include conscript demographic and background variables, aptitude, mental and physical health, and pertinent attitudes and perceptions. The research extends previous research by considering a wider set of predictors, over time, and allows for generalization through the non-U.S. sample. Those separated were significantly different from those completing their military service on numerous predictor variables. Especially strong in predicting attrition were measures of the conscript's sense of military obligation, education level, physical health, criminal record, economic history, expected adjustment, age, and past behavior problems. The models accounted for 25% to 40% of the variance in attrition but were modest in their ability to correctly classify those who were separated.

TR 1193
The Relation Between Sociometric Choices and Group Cohesion
Mikael Salo. November 2006. (ADA460549)

This research examined the relations between sociometric choices and group cohesion. Data were collected from records and by survey and sociometric questionnaires given to 537 group members in 47 squads near the end of their 6 to 12 months of conscript training in Finland. Results showed moderate, significant correlations between the number of sociometric choices received and perceived cohesion such that Soldiers who were more often chosen as a friend or a combat partner felt that there was more cohesion in their group. Also, Soldiers who received more sociometric choices had higher expected personal and group performance, better performance as rated by their instructors, more positive attitudes toward military service and future refresher training, greater well-being during conscript service, and fewer exemptions from duty during their service. Groups where Soldiers made more in-group sociometric choices were also more cohesive based on questionnaire measures of cohesion. Overall, the findings suggest that sociometric individual choices and group level sociometric cohesiveness are related modestly but positively to questionnaire-based cohesion measures and a wide range of criteria covering performance, attitudinal, and behavioral outcomes.

TR 1194
Army Excellence in Leadership (AXL): A Multimedia Approach to Building Tacit Knowledge and Cultural Reasoning
Michelle L. Zbylut, Kimberly A. Metcalf, Julia M. Kim, Randall W. Hill, Jr., Scott Rocher, & Christopher Vowels. January 2007. (ADA461995)

This report presents findings from a preliminary examination of the Army Excellence in Leadership (AXL) system, a leader intervention that targets the development of tacit leadership knowledge and cultural awareness in junior Army officers. Fifty-five junior officers interacted with a pilot version of a cultural awareness module from the AXL system. Results indicated that the AXL approach resulted in improvements in leader judgment on a forced-choice measure. Furthermore, results indicated that cultural issues were more salient to leaders after completion of the cultural awareness module. Reactions to training were generally positive, with officers indicating that the cultural awareness module was useful and stimulated thought. Additionally, this investigation explored the relationship between affect and learning and found that emotional responses to the AXL system were related to learning-relevant variables, such as judgment scores and officer reports that they could apply the training to their activities as a leader.

TR 1195
Predictor Development and Pilot Testing of a Prototype Selection Instrument for Army Flight Training
Kenneth T. Bruskiewicz, Lawrence C. Katz, Janis Houston, Cheryl Paullin, Gavan O'Shea, & Diane Damos. February 2007. (ADA464020)

As part of a project by the U.S. Army Research Institute for the Behavioral and Social Sciences Rotary Wing Aviation Research Unit (ARI RWARU) to produce a selection instrument for Army flight training, several viable, existing predictor measures were identified and several new predictors were developed. The resulting prototype battery was pilot tested with 80 aviator candidates prior to beginning flight school, who provided performance data and subjective feedback. This pilot test resulted in revisions and decisions as to the predictors to be included in the prototype battery for preliminary validation.

TR 1196
Program Evaluation Metrics for U.S. Army Lifelong Learning Centers
Anna T. Cianciolo. March 2007. (ADA465470)

Lifelong Learning Centers (LLCs) comprise a suite of technologies that enable online posting of schoolhouse curricula and collaboration among distributed learners. These technologies connect the field Army to Army schoolhouses, simultaneously improving course currency and supporting training in the field. The impact of lifelong learning on organizational excellence seems clear. However, it is unknown how LLCs promote readiness using educational technology and how LLC effectiveness should be measured. The purpose of this research was to develop a comprehensive,

generalizable framework for conceptualizing the effectiveness of LLCs and for capturing the drivers of success. The framework and associated metrics were used to conduct an evaluation of a pilot LLC located at Fort Leavenworth. This evaluation indicated the importance of taking a causal approach. An assessment of outcomes alone would have indicated that the initiative had achieved its goals but would have obscured the fact that some of these goals--teaching and learning effectiveness--were achieved largely independently of the use of learning technologies. The basis of the framework in theory makes it generalizable not only across current and future LLCs, but also across other blended learning initiatives, addressing a gap in the scholarly literature regarding the effectiveness assessment of educational technology.

TR 1197
Evaluation of the Effectiveness of Flight School XXI
Michael L. Wesolek. March 2007. (ADA465655)

This research examined the effectiveness of the U.S. Army's Flight School XXI (FSXXI) flight training program in comparison to the previous (legacy) flight training program. The primary focus of the research was whether or not FSXXI produces graduates that are more proficient, and subsequently become fully mission capable pilots in fewer flight hours than graduates of the legacy flight training program. A 2X2 repeated-measures ANOVA was conducted to compare the readiness level progression rates of graduates of the FSXXI and the legacy flight training program. These data were supplemented by an instructor pilot survey and a cost comparison. It was found that there was a statistically significant difference between the FSXXI pilots and the legacy pilots, and in each of these cases the number of hours required for FSXXI graduates to become fully mission capable pilots was lower than for legacy pilots. Additionally, there was no difference between instructors' perceptions of FSXXI and legacy pilot aptitude for the CH-47 aircraft, but there was a difference for the UH-60 aircraft. The cost comparison revealed that legacy training is substantially less expensive than FSXXI training for both types of aircraft. These findings are discussed in relation to the existing research in this area, including experiential learning and Kolb's learning cycle.

TR 1198
Army Enlisted Personnel Competency Assessment Program: Phase III Pilot Tests
Karen O. Moriarty & Deirdre J. Knapp (Eds). March 2007. (ADA465808)

In the early 1990s, the Department of the Army abandoned its Skill Qualification Test (SQT) program due primarily to maintenance, development, and administration costs. This left a void in the Army's capabilities for assessing job performance qualification. To meet this need, the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) instituted a 3-year program of feasibility research related to the development of a Soldier assessment system that is both effective and affordable. The PerformM21 program has two mutually supporting tracks. The first focuses on the design of a testing program and identification of issues related to its implementation. The second track is a demonstration of concept – starting with a prototype core assessment targeted to all Soldiers eligible for promotion to Sergeant, followed by job-

specific prototype assessments for several Military Occupational Specialties (MOS). The prototype assessments were developed during the first 2 years of the research program. The present report describes work conducted in the final year of the PerformM21 program, in which five prototype MOS-specific assessments (along with the common core examination) were pilot tested on a sample of specialists/corporals.

TR 1199
A Criterion-Related Validation Study of the Army Core Leader Competency Model
Jeffrey Horey, Jennifer Harvey, Pat Curtin, Heidi Keller-Glaze, Ray Morath & Jon Fallesen. April 2007. (ADA468750)

This report describes the gathering and evaluation of evidence of the criterion-related validity of the Army core leader competency model. Predictor data, in the form of ratings of the competencies and components, were collected from subordinates. Criterion data, in the form of ratings of leader effectiveness, were collected from supervisors. Results showed evidence of the criterion-related validity for the Army core leader competencies. Implications for an instrument to assess the competencies and components are also discussed.

TR 1200
FOCUS: A Model of Sensemaking
Winston R. Sieck, Gary A. Klein, Deborah A. Pelusa, Jennifer L. Smith & Danyele Harris-Thompson. May 2007. (ADA469770)

Sensemaking is a relatively new concept that has largely been associated with Weick (1995) and his work in organizational behavior. Sensemaking refers to the set of processes involved in trying to improve one's understanding of a situation, often in response to surprise. The primary purpose of the current project was to unpack and develop the concept of sensemaking, principally by developing and testing a cognitive model of the processes involved. The resulting Data/Frame model posits a highly interactive relationship between data inputs and mental representations or "frames" for interpreting data. The Data/Frame model also proposes six key sensemaking activities for handling frames in light of (anomalous) data: Elaborating, Questioning, Comparing, Preserving, Re-framing, and Seeking. A secondary aim was to provide recommendations for training and other applications of the model that would be of direct benefit to the warfighter. To that end, several specific links to applied issues in domains such as information operations, intelligence analysis and combat systems design for UAV control have been developed and pursued. At this juncture, the concept of sensemaking and the Data/Frame model appear to be supported by the data, and also quite useful for military applications.

TR 1201
Social Structures Affecting Army Performance
David R. Segal. June 2007. (ADA469700)

The Center for Research on Military Organization undertook a multi-year research program on the impact of social change on the performance of Army units and of Soldiers after the end of the Cold War in Europe and the first Gulf War. We were concerned with the shift from deterrence and defense to contingency operations, the adjustment of young adults to the military, the demographic diversity of the military, the impact of the history and culture of our military and the armed forces of other nations, and the utilization of behavioral science as a dimension of the expert knowledge of the military profession. A year after the initiation of this program, the events of September 11 2001 changed the nature of American military organization/mission. We conducted research on Soldiers during periods of contingency operations, when six-month deployments in successive years signified high operational tempo, and a period of continuous operations, when year long deployments, including large numbers of reserve component personnel became more common. During this period, we studied enlistment propensity, motivations to serve, and work attitudes among American youth, adjustment to the Army, civil-military relations, gender and racial integration, organizational change, leadership, and the utilization of behavioral science knowledge.

TR 1202
Task Difficulty and Prior Videogame Experience: Their Role in Performance and Motivation in Instructional Videogames
Karin A. Orvis, Daniel B. Horn & James Belanich. July 2007. (ADA470218)

Videogame-based environments are an increasingly popular medium for training Soldiers. This research investigated how various strategies for modifying task difficulty over the progression of an instructional videogame impact learner performance and motivation. Further, the influence of prior videogame experience on these learning outcomes was examined, as well as the role prior experience played in determining the optimal approach for adjusting task difficulty. Participants completed a game-based training task under one of four task difficulty conditions: static, increasing, adaptive-low and adaptive-high. All participants completed an identical pre-training trial, 10 practice trials varying in difficulty level according to condition, and a final performance trial. Results demonstrate that learner performance and motivation significantly improved in all difficulty conditions. Yet, contrary to expectations, no single condition maximized these outcomes relative to others. There was a significant 3-way interaction between performance, condition, and prior videogame experience. Further, prior experience was found to significantly influence these learning outcomes. Learners with greater experience consistently performed better regardless of condition. Experienced gamers also initially reported high task self-efficacy and set higher performance goals for the training task. The results of this research provide information useful to training game developers and instructors utilizing videogames as training tools.

TR 1203
Case Method Instruction: 25 Minutes Can Make a Difference
Michelle L. Zbylut, Jason M. Brunner, Christopher L. Vowels, & Julia M. Kim
July 2007. (ADA472171)

Case method instruction has been universally endorsed as an effective teaching approach, yet little empirical research provides evidence of this claim. This report describes research that investigated the importance of the discussion component of case method instruction to learning. In addition to collecting data from 182 USMA cadets, this investigation extends past research on case method instruction by incorporating the perspectives of instructors. Findings indicated that students produced better quality answers and were better able to diagnose leadership problems in the scenario after participating in discussion, even though the time allotted for discussion was relatively short. Self-reports of instructors provided corroborating evidence that the instructional approach was useful for accomplishing learning objectives and that class discussion quality was high. Additional results point to the importance of having an instructor's manual available for discussing case studies. Results also suggest that the particular case study used, *Power Hungry*, generalizes from an audience of junior officers and NCOs to a cadet audience.

TR 1204
Expertise as Effective Strategy Use: Testing the Adaptive Strategies Model in the Ill-Structured Domain of Leadership
Mark U. McGregor, Christian D. Schunn, & Lelyn D. Saner. August 2007. (ADA472099)

This research tested the Adaptive Strategies Model (ASM; Lemaire & Siegler, 1995) of expertise in the ill-defined domain of leadership. More specifically, we examined expert/novice differences in all components of the ASM: strategy existence, strategy choice, strategy base-rate, and strategy execution. In Experiment 1 Leadership Scenarios elicited free-text responses from undergraduates (novices), ROTC Cadets (intermediates), and US Army Platoon Leaders (experts). Each response was coded into one of ten underlying Leadership Strategies thought to underlie each response, resulting in patterns of individual strategy use. Experiment 2 used a new group of experts to gather ratings of the execution accuracy of responses from Experiment 1. The results show that the ASM is able to discern expert/novice differences in strategy choice, strategy base-rate, and strategy execution. As leaders progress from novice to expert, they a) use multiple strategies across various scenarios, b) develop the ability to make optimal choices about when and where to use particular strategies, c) develop an increased sensitivity to each different strategy's base rate of success in the environment, and d) develop the ability to execute strategies more accurately. The training of ill-defined skills, such as leadership, may be improved by focusing on the four components of ASM.

TR 1205
Concurrent Validation of Experimental Army Enlisted Personnel Selection and Classification Measures
Deirdre J. Knapp, & Trueman R. Tremble (Eds.). April 2007. (ADA471963)

New Predictors for Selecting and Assigning Future Force Soldiers (Select21) is concerned with Soldier accession and job classification. The Select21 goal is to ensure the Army acquires Soldiers with the knowledge, skills, and attributes (KSAs) needed for performing well and fitting well in a transformed Army. The objectives of the project are to (a) identify Future Force job demands and the pre-enlistment KSAs required to meet them, (b) develop measures of job performance and critical KSAs, and (c) validate the experimental predictor (KSA) measures in a concurrent criterion-related validation. This report documents the method and results of the criterion-related validation.

The predictor set includes measures of cognitive ability, temperament, psychomotor skills, values, expectations, and experience. Performance criteria include rating scales completed by supervisors and peers, technical knowledge tests, a situational judgment test, and indicators of person-environment fit (e.g., job satisfaction). Versions of these measures suitable for all first-term Soldiers regardless of specialty were administered to 812 Soldiers. Analyses indicated that scores from the Armed Services Vocational Aptitude Battery (ASVAB) predict both current and future performance (as assessed by future-oriented rating scales) and that the experimental predictors provided incremental validity, particularly in regard to attitudinal criteria.

TR 1206 - Cancelled

TR 1207
Training Requirements for Visualizing Time and Space at Company and Platoon Level
Jason Sidman & Mike Garrity. September 2007. (ADA471960)

Success in military operations increasingly rests on the ability of small units to counter asymmetric threats in the varied and foreign urban settings that typify the contemporary operating environment (COE). However, the physical dimensions and cultural characteristics of urban environments dramatically compress and complicate the dynamics of space and time so fundamental to visualizing and executing company and platoon operations. To help leaders visualize the interactions of space and time (VISTA), a cognitive task analysis (CTA) was conducted based on workshops with active and retired military personnel (n = 50). The CTA used a representative scenario and supporting vignettes to elicit and identify the cognitive skills required to visualize time and space patterns in the COE such as vehicle and human traffic, tribal and political boundaries, and culturally sacred structures. The CTA underscored the need for visualization training in small units and identified a related set of training principles, stages, and techniques. On that basis, prototype examples of visualization training were developed in five modules that feature scenario-based contexts, multimedia delivery, and deliberate practice. A limited evaluation of the training resulted in positive and constructive guidance for future development and utilization.

TR 1208
Personality Profiles of U.S. Army Initial Entry Rotary Wing Students Versus Career Aviators
Robert L. Grice, & Lawrence C. Katz. September 2007. (ADA472259)

The U.S. Army Research Institute for the Behavioral and Social Sciences Rotary Wing Aviation Research Unit (ARI RWARU) administered the Revised NEO Personality Inventory to 217 student Army aviators awaiting Initial Entry Rotary Wing training. Scores reflected the incoming aviators' standings on five personality factors: neuroticism, extraversion, openness, agreeableness, and conscientiousness. The male student factor and facet scores were then compared with a sample of male career Army aviators. Personality differences and similarities between the two samples are discussed as laying the foundation for longitudinal research.

TR 1209 – cancelled

TR 1210
Foundations of Military Pilot Selection Systems: World War I
Diane L. Damos. September 2007. (ADA474611)

This report describes the development of the U.S. Army pilot selection system beginning in World War I. It starts with a review of aviation in the United States up to 1917. The phases of flight training then are described with the associated failure and fatality rates. Some cost estimates for each phase also are provided. Finally, the pilot selection system itself is described. Because the selection system was revised over time, the early system (administered from May, 1917 to February, 1918) is described first, followed by the revised system (administered from March, 1918 to November, 1918). Additions to the initial battery are described, as are the tests that were under development at the time of the Armistice.

TR 1211
Simulator Sickness During Emergency Procedures Training in a Helicopter Simulator: Age, Flight Experience, and Amount Learned
David M. Johnson. September 2007. (ADA474563)

This research measured simulator sickness both before and after exposure to a helicopter simulator that was being used for emergency procedures training. Research issues were the incidence and magnitude of simulator sickness, aftereffects, susceptibility, and the effect of simulator sickness on training effectiveness. A total of 474 AH-64A (Apache) Army aviators participated in this research. The Simulator Sickness Questionnaire (SSQ) was administered prior to simulator exposure, immediately after simulator exposure, and twelve hours later. The incidence rate following simulator exposure was 68 percent. The SSQ Total Severity score was significantly larger immediately after exposure than it was prior to simulator exposure or twelve hours later. Age was significantly and positively correlated with SSQ score, after the effect of total flight hours was held constant. Flight hours did not correlate with SSQ

score, after the effect of age was held constant. These results were consistent with postural instability theory. Both prior history of motion sickness and prior history of simulator sickness were significantly and positively correlated with SSQ score. The strongest susceptibility factor noted in this research was prior history of simulator sickness. SSQ score was not correlated with training effectiveness, as measured by a short behavioral test.

TR 1212
Enlisted Personnel Allocation System (EPAS) Enhancements to the Recruit Quota System (REQUEST) – A Simulation Evaluation
Paul J. Sticha, Tirso E. Diaz , Peter M. Greenston, & Peter B. McWhite.
September 2007. (ADA474896)

The Enlisted Personnel Allocation System (EPAS) is an automated classification methodology that allocates applicants to jobs so as to maximize predicted performance while meeting accession requirements. It is designed to work as a subsystem of the Recruit Quota System (REQUEST). For this project the "operational" EPAS implemented an EPAS-enhanced REQUEST (EER) procedure in which MOS opportunities identified by REQUEST are reordered by EPAS optimization results. Although previous evaluations provided evidence of the utility of EPAS, none of them had addressed the EER.

This field test evaluated the EER using a non-intrusive, but highly realistic simulation framework. It compared the EER and REQUEST in terms of classification efficiency and capability to meet Army accession requirements. The results of the analysis indicated that using EPAS to reorder the REQUEST opportunity list could increase the visibility of opportunities in which an applicant would be likely to perform well, while extracting only a small penalty on the visibility of priority MOS. Despite the positive effect of EPAS on the opportunity lists, there was essentially no difference in the average predicted performance between the two conditions. The lack of a performance difference between REQUEST and the EER reflects more realistic understanding and modeling of applicant job-choice behavior and a possible loss in the classification efficiency of the ASVAB test battery. The authors discuss the limitations of the EER design, and make a case for extending the simulation capability to fully utilize the EPAS optimization results.

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Research Reports

RR 1862
Assessing Army Professional Forums – Metrics for Effectiveness and Impact
Anna T. Cianciolo, Charles G. Heiden, & Michael I. Prevou. October 2006. (ADA464632)

The rate of change in the operational environment outpaces the development of doctrine and schoolhouse instruction, leaders must direct their own development in order to adaptively and professionally meet the challenges brought on by Army transformation. Army professional forums (APFs), powered by advances in collaborative toolsets and multimedia presentation software, provide a means for leader self-development and professional growth. The research was conducted as an initial exploration of this area.

The early stages of this initiative present the most valuable opportunity to establish checks that ensure the initiative is functioning effectively and meeting organizational goals. Establishing such checks enhances the organizational impact of the initiative. The APF assessment framework developed in the present research enables the assessment of APFs during the early stages of the Army knowledge-management initiative.

RR 1864
The Training, Retention, and Assessment of Digital Skills: A Review and Integration of the Literature
Gregory A. Goodwin. November 2006. (ADA470707)

Skill training, retention, and assessment research from academia, industry, and the government is reviewed and its implications for digital skill training are discussed. Factors that affect digital skill retention are procedural (e.g., the timing and sequencing of training trials, training techniques employed), individual (intelligence or background knowledge), and task related (e.g., the number of steps per task, the cognitive difficulty of selected steps). Some of these factors have also been shown to impact digital operator training, but additional research needs to be done. Few experiments have made broad comparisons across all variables or have effectively quantified ways to evaluate or design effective digital training. Recommendations about how to modify specific digital courses should therefore attempt to validate those changes empirically. Much less work has been done in the area of collective digital training despite the fact that this comprises the majority of the training prescribed in the Army Digital Training Strategy. Research on the assessment of digital skills has produced a number of tools and procedures for assessing digital skills for both individual and collective training. Many of these tools have been well received by units who have used them but the tools still need to be formally validated.

RR 1865
Performance in Non-Face-to-Face Collaborative Information Environments
Brooke B. Schaab, J. Douglas Dressel, Mark A. Sabol, & Andrea L. Rittman. January 2007. (ADA464628)

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Using technology to obtain and process information requires training not only in human-computer interaction but also in human-human-computer (collaborative) interaction. Warfighters must not only develop their own situational awareness (SA), they must understand each others' SA (Pew, 1995). This common ground is what each collaboration participant assumes about the others to ensure effective interactions (Ross, 2003; Wellons, 1993). Communication is key. Collaborators must coordinate and share information. Collaboration influences military operations at all levels. Technical interoperability is not enough to produce the synchronization required.

RR 1866
A Case for Decentralized Training
Jean L. Dyer, James H. Centric, & Richard L. Wampler. January 2007. (ADA462739)

The report summarizes how and why the Army moved to a centralized training strategy, where training is planned and controlled by company or higher headquarters. Information is presented on how the Opposing Force (OPFOR) at the Joint Readiness Training Center (JRTC) has implemented a decentralized approach to training, where training is planned and executed at the squad or platoon level. This strategy fits well into the OPFOR's decentralized mode of operations. Interviews with 14 OPFOR members provided key insights into what makes decentralized training work and how to use that approach to attain trained Soldiers and leaders. The OPFOR also indicated that both centralized and decentralized training are needed in units as they are complementary modes of training. Five critical factors essential to ensure a decentralized training program can be successfully implemented are outlined. These are selecting tasks that are appropriate to be trained in a decentralized mode, using qualified trainers, creating an environment conducive to this type of training, developing an assessment system applicable to the decentralized training process, and providing the necessary training support resources. Finally, a proposed strategy for incorporating more decentralized training Army-wide is presented.

RR 1867
After Action Reviews: Current Observations and Recommendations
Margaret S. Salter, & Gerald E. Klein. January 2007. (ADA463410)

The purpose of this research was to examine the conduct of After Action Reviews (AARs) at the Combat Training Centers (CTCs). The CTC selected was the Joint Readiness Training Center (JRTC) where the likelihood of small unit leader involvement in decision-making situations has increased, bringing a heightened importance to lower level AARs. In cooperation with the JRTC Operations Group, researchers examined both platoon and company AARs. The results confirm earlier research that shows the AAR is both a science and an art. Even the best-trained Observer/Controllers (O/Cs) tend to err on the side of providing too much information. Facilitating a discussion rather than a lecture is a skill that must be developed and reinforced in training and in practice. Recommendations are included, as well as a prototype AAR rating scale that could be used as a job aid, performance checklist, or as an instructional tool during O/C training.

RR 1868
Accelerating the Development of Adaptive Performance: Validating the Think Like a Commander Training
Scott B. Shadrick, James W. Lussier, & Christopher Fultz. February 2007.
(ADA464668)

The contemporary operational environment and the Global War on Terrorism require junior leaders in the U.S. Army to exhibit high levels of adaptive performance. This research examined whether or not the tactical environment of Operation Iraqi Freedom (OIF) and Operation Enduring Freedom (OEF) contributes to the development of more adaptive leaders. In addition, the level of adaptive thinking for lieutenants, captains, majors, and lieutenant colonels was investigated. The results revealed that leaders with OIF or OEF experience performed better on a test of adaptive thinking, and that performance increases with rank. The results support the validity of the adaptive thinking measurement instrument and the relevance of the Think Like a Commander training program. In addition, the results suggest that deliberate training methods may be more effective and efficient than live, virtual, or constructive experiential learning environments.

RR 1869
Assessment of Two Desk-Top Computer Simulations Used to Train Tactical Decision Making (TDM) of Small Unit Infantry Leaders
Scott A. Beal. April 2007. (ADA468772)

Fifty-two leaders in the Basic Non-Commissioned Officer Course (BNCOC) at Fort Benning, Georgia, participated in an assessment of two desk-top computer simulations used to train tactical decision making. Thirteen leaders trained with the Soldier Visualization Station (SVS) simulation, while 39 others trained with Simulation Exercise, or SimFX. Pre-simulation exercise measures included military and simulation experience, decision-making style, and tactical situation judgment. A questionnaire administered to leaders following simulation exercises documented their sense of personal involvement during mission execution and their perceptions of the training value of the simulations. Leaders in both groups were assessed individually for their ability to recognize and implement sound tactical decisions while serving as a squad leader of a light Infantry squad during patrol and defense missions in an urban environment. Results suggest that, in general, the use of desk-top simulations have potential value for training the tactical decisions leaders make during exercises that require greater expenditures of resources. However, the methods used to train with simulations impacted leaders' tactical decision making, their perceptions of the training value of simulations, and their ideas about what they learned from the experience.

RR 1870
The Application of a Model of Adaptive Performance to Army Leader Behaviors
Jennifer S. Tucker, Katie M. Gunther, Robert J. Pleban, Gregory A. Goodwin, & Adam W. Vaughan. May 2007. (ADA469726)

The present research sought to better define the junior Army leader behaviors reflecting adaptive performance and offer recommendations for enhancing these adaptive capabilities. Pulakos and colleagues' (2000) eight-dimension model of adaptive performance was applied to leader behaviors performed in operational and training contexts. The present research also included White and colleagues' (2005) *Leads an Adaptable Team* dimension. Interview data from two different archival datasets were examined. Results showed that the majority of the incidents generated by leaders in operational contexts reflected two dimensions of the model: *Deals with Uncertain and Unpredictable Work Situations* and *Handles Emergencies or Crisis Situations*. Many of the remaining incidents tapped three other dimensions: *Solves Problems Creatively, Learns Work Tasks, Technologies, and Procedures,* and *Handles Work Stress*. For the trainers, the majority of the incidents tapped three dimensions of the model: *Solves Problems Creatively, Leads an Adaptable Team,* and *Deals with Uncertain and Unpredictable Work Situations*. For both research projects, the model sufficiently addressed the adaptive capabilities described in the critical incidents when it was modified to include specific military leadership behaviors. However, not all of the dimensions were represented in each sample. Differences in the adaptive capabilities between the two research projects are most likely due to the limitations of the training research project. Recommendations for developing training programs aimed at maximizing adaptive performance are discussed.

RR 1871
Developing Army Leaders Across Components: Assessing Knowledge Similarities and Differences
Teresa Z. Taylor. May 2007. (ADA469719)

More than ever, it is critical that Army leaders are able to perform leader responsibilities with a high degree of expertise in a variety of skill-sets. Army leaders must demonstrate intrapersonal, interpersonal and organizational expertise in technical, tactical, and leader tasks under ambiguous and constantly changing conditions. Leaders develop their skills through a well-developed system of formal institutional training, experience gained through operational assignment and self-development. However, despite the Army's comprehensive, methodical and standardized system for developing leaders, some are more effective than others. Recent research has explored how knowledge, specifically tacit knowledge, makes leaders more effective. That research was oriented on active Army officer tacit knowledge; this research seeks to measure differences in tacit knowledge levels between active (AC), U.S. Army Reserve (USAR) and Army National Guard (ARNG) officers. In the spring of 2004, 666 ARNG, USAR, and AC Lieutenants, Captains, and Majors were surveyed to measure their tacit knowledge as well as their capacity for self-knowledge. Results showed that there are differences in levels of tacit knowledge between the three Army components, as well as a correlation between individual tacit knowledge and the person's ability to self-assess their own knowledge strengths and weaknesses. Findings in this research can be used to enhance leader development programs by expanding levels of tacit knowledge to facilitate shared mental models of effective leadership in all Army leaders.

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RR 1872

Retention of Selected FBCB2 Operating Skills among Infantry Captains Career Course (ICCC) Students

Gregory A. Goodwin, Bruce C. Leibrecht, Richard L. Wampler, and Stephen C. Livingston, & Jean L. Dyer. July 2007. (ADA470741)

This report describes an investigation of the retention of Force XXI Battle Command Brigade and Below (FBCB2) operator knowledge and skills. Infantry captains who attended a two-day training course participated in an end-of-course test followed by a retest eight weeks later. Participants answered questions about and performed tasks on FBCB2. Performance on the knowledge test showed no decay while performance on the hands-on test declined slightly (10%), but significantly. The majority of participants (72%) had used FBCB2 in combat. Interestingly, the best single predictor of performance on the hands-on test was a self-reported measure of general computer experience. In general, though, it was difficult to predict performance on the hands-on test. Multiple regression analyses using a variety of experience and knowledge measures accounted for only 25-30% of the variability in recall scores. Implications of these findings for trainers, training developers, and Army units are discussed.

RR 1873

Positive Transfer of Adaptive Battlefield Thinking Skills

Scott B. Shadrick, Brian T. Crabb, James W. Lussier, & Thomas J. Burke. July 2007. (ADA470215)

Over the past decade the U.S. Army has identified an emerging need to train and develop leaders who are more adaptive and capable of responding effectively to a wide range of military operations. In response, the U.S. Army Research Institute for the Behavioral and Social Sciences has developed the Think Like a Commander (TLAC) training approach that utilizes the principles of deliberate practice to train Army officers in adaptive battlefield thinking. This research demonstrates that the training received in TLAC transfers to other tasks related to battle command, namely the production of a company level Operations Order (OPORD). Specifically, students enrolled in the Armor Captains Career Course who received TLAC training produced better OPORDs than students who did not receive TLAC training but who did engage in traditional tactical decision games. These results reinforce the continued use of TLAC in institutional, self-development, and unit training.

RR 1874

Social Awareness and Leader Influence: A Proposed Model and Training Intervention

Rose A. Mueller-Hanson, Erin C. Swartout, Courtney L. Morewitz, and Chuck T. Keil, Timothy P. McGonigle, Cody Martin, Carolyn Parish, & Raymond A. Morath. July 2007. (ADA472179)

A leader's ability to influence others is likely related to the leader's level of social awareness (knowing how one is perceived by others in that environment.) Based on

perceptions of the social environment, a leader must also alter behaviors as needed to more effectively relate to others, a process which has been termed "interpersonal adaptability". Interpersonal adaptability is central to the role of the leader who must use influence and persuasion to successfully accomplish the mission through the work of subordinates. The objectives of this research are to develop a model of social influence, to propose training, and to pilot test the concepts. To meet these objectives, we first provide an overview of the relationship between social awareness and influence. Second, we describe a model of social awareness and influence. Third, we describe how these concepts link to the leader competencies defined in FM 6-22. Next, we discuss implications of this research for training leaders to enhance their social awareness and influence skills, and we present the concepts that were developed for training these skills. Finally, we describe how these concepts were pilot tested, and we present the results and our conclusions from the pilot.

RR 1875
Development and Content Validation of Crisis Response Training Package Red Cape: Crisis Action Planning and Execution
Scott B. Shadrick, Peter S. Schaefer, & Jeff Beaubien. August 2007. (ADA472136)

Military and civil crisis response organizations need training which accelerates the development of expertise in effective and efficient interagency cooperation and collaboration. The development of such training necessitates the use of a cognitive task analysis (CTA) method which can draw upon distributed expertise to understand not only current but future task conditions. A newly developed CTA method known as the Flexible Method of CTA (FLEX) was applied to the domain of crisis response and resulted in the training program known as Red Cape: Crisis Action Planning and Execution. Quantitative assessments of the training content validity were elicited from seasoned crisis response personnel. Analysis of the assessments supports the use of FLEX in developing crisis response training. Proposed extensions and refinements of existing content validation procedures are also discussed.

RR 1876
PACERS: Platoon Aid for Collective Employment of Robotic Systems
Paula J. Durlach. August 2007. (ADA472135)

This report presents guidance to help train platoons equipped with organic unmanned systems. The Army currently is supplying platoons with both prototype and commercially available unmanned systems to evaluate military utility and to develop tactics, techniques, and procedures; however, the training provided prior to these "experiments" focuses almost entirely on individual operator training. While different unmanned systems require different detailed procedures, there are certain aspects of operation applicable across systems, and training could be given on these system-general aspects of employment. The purpose of this report is to (1) lay out these system-general aspects and (2) suggest a list of activities to focus on to help train system integration. Each activity has associated observations and related after-action review questions applicable to both air and ground assets, and avoiding the particulars

of any specific system. Trainers will not have the opportunity to become conversant with the specifics of the myriad of systems they may encounter. Besides being system-general, the training guidance provided is also mission-general. It suggests appropriate observations and questions to facilitate coaching and after action review discussion specifically with respect to system employment. Therefore, these represent an addition to, not a replacement of, mission-specific observations and after-action review topics.

RR 1877
Winning the War and the Relationships: Preparing Military Officers for Negotiations With Non-Combatants

Orly Ben-Yoav Nobel, Brian Wortinger, & Sean Hannah. August 2007. (ADA472089)

Current operations in Iraq and Afghanistan involving counterinsurgency, peace-keeping, stability and support missions and nation building have increased interest in cross-cultural negotiation skills as a central component of military leadership. This report develops a conceptual framework capturing the unique characteristics of negotiations between military personnel and local civilians that can guide the design of negotiation training programs for officers preparing to deploy. Interviews were conducted with 20 Lieutenants and 16 Captains who returned from deployments to Iraq. Content analysis indicated that negotiations with civilians focused largely on rebuilding projects, security, and civil affairs issues. Key challenges reported by officers included 1) the need to negotiate and mediate in the face of sectarian loyalties, 2) ethical dilemmas, 3) the development of work arrangements in the face of conflicting cultural values and behavioral norms, 4) negotiating in the face of threat and determining the appropriate use of power, 5) emotional self-regulation, and 6) adaptive response to a wide range of conflicting responsibilities. Iraqi negotiation techniques appeared consistent with non-Western cultural expectations of the goals and tactics of negotiation.

RR 1878
Techniques and Practices in the Training of Digital Operator Skills

Bruce C. Leibrecht, Gregory A. Goodwin, Richard L. Wampler, & Jean L. Dyer. September 2007. (ADA474556)

This report presents research on classroom training practices in Army Battle Command System courses. The investigation examined a sample of institutional courses using observation and classification techniques. Three learning theories—behaviorist, cognitive, and constructivist—guided the collection and analysis of data. Cognitive and behaviorist training techniques were observed somewhat more frequently than constructivist techniques. The frequency of training techniques depended on the type of course (operator vs. leader orientation), instructor style, and progression across days. The discussion offers potential improvements in the areas of training techniques, program of instruction, training environment, and instructional innovation. The report is intended for use by training designers and developers, digital trainers, and training managers working in institutional settings.

RP 2007-01
Red Cape: Crisis Action Planning and Execution
Jeff Beaubien, Michael Paley, Sibyl Badugu, Scott Shadrick, Charles Ennis, &
Steve Jacklin. December 2006. (ADM001908)

The Red Cape training product is the result of a collaborative research project by
the U.S. Army Research Institute for the Behavioral and Social Sciences and the
Indiana Army National Guard. The intent of the research was to develop training to
improve emergency operations decision making, planning, and execution for Army
National Guard and civil-military, interagency leaders. The training uses cognitive battle
drills to apply deliberate practice training concepts to nine expert crisis management
skills, such as keeping a focus on the mission priorities, seeing the big picture, and re-
prioritizing as necessary. The *Red Cape* training involves the presentation of theme-
based situations to train expert behaviors. The prototype system includes an initial set
of 15 vignettes with expert solutions. The present research product provides the
materials needed to implement the Red Cape training.

RP 2007-03
**Army Excellence in Leadership (AXL): Educating Army Leaders with the Tripwire
Film**
Kimberly A. Metcalf & Michelle L. Zbylut. March 2007. (ADA465830)

This research product contains an instructor's manual which describes how to use
the *Tripwire* case study from the Army Excellence in Leadership (AXL) system within a
traditional classroom setting. The manual is intended to help instructors prepare for
classroom discussions of leadership challenges and issues embedded within the *Tripwire*
scenario. Because the *Tripwire* scenario is built around junior leadership issues in Iraq,
instructors may find the Tripwire lessons particularly relevant for junior officers who will
deploy to the Middle East. However, instructors can tailor *Tripwire* lessons to suit a
broader training audience. The manual contains a summary and hard copy of the
Tripwire case study, a description of potential teaching objectives and related discussion
questions, and guidance on how to facilitate an effective classroom discussion. An
overview of the AXL.net system, technical requirements, and contact information for
obtaining the case study is also provided.

RP 2007-04
Red Cape: Crisis Response Training for National Guard and Interagency Teams
U.S. Army Research Institute-Fort Knox & the Indiana National Guard. August 2007.
(ADM002052)

The Red Cape training product is the result of a collaborative research project by
the U.S. Army Research Institute for the Behavioral and Social Sciences and the
Indiana National Guard. The intent of the research was to develop training to improve
emergency operations decision-making, planning, and execution for Army National

Guard and civil-military interagency leaders. The training uses cognitive battle drills to apply deliberate practice, theme-based training concepts to nine expert crisis management behaviors, such as keeping a focus on the mission priorities, seeing the big picture, and re-prioritizing as necessary. The Red Cape training involves the presentation of situations to train theme-based expert behaviors. The present research product provides the materials needed to implement the Red Cape training for National Guard, first responders, coordinating agencies, and supporting agencies.

RP 2007-05
Exemplar Training for Battalion Visualization
William McElroy, James Bell, Scott B. Shadrick, Dennis K. Leedom, Robert A. Pokorny, & Jacqueline A. Haynes. August 2007. (ADM002045)

This research product documents a proof of principle package used to train battlefield visualization skills at the battalion level. The training is a result of a cognitive task analysis to identify important visualization skill at a battalion level of command. The cognitive task analysis consisted of a review of current U.S. Army doctrinal literature, a review of visualization from a psychological perspective, and a series of interviews with military officers having recent experience in either a command position or as a battalion Operations and Training Officer (S-3) or Executive Officer (XO). Based on findings from the cognitive task analysis, 11 skill areas were identified as potential focal points of future training development. The findings from the cognitive task analysis were used to design and develop exemplar training exercises for two skill areas; identify key problem elements employing the principles of METT-TC and Elements of Operational Design
and discover/exploit newly revealed problem elements to expand the visualization. This product provides an introduction to the battlefield visualization process, describes individual skill areas, and provides six example training manuals.

RP 2007-06
Battle Command Visualization 101: A Near Term Approach to Embedded Training
John M. Fisher, Charles G. Heiden, James R. Gossman, Charlotte H. Campbell, Tim Generalao, Michael G. Breidenbach, Carl W. Lickteig, & Bryan M. Leras. August 2007. (ADM002025)

This product illustrates a new approach to training that complements the Army's ongoing embedded training (ET) efforts and provides realistic training solutions for the current Force wherever deployed. The approach combines training theory and technology in a way that counters the usually inverse relationship between training fidelity and availability. The Battle Command Visualization (BCV) 101 product focuses on training conceptual skills needed by small unit command groups to see the battlefield with unmanned and networked sensors. The approach advances the potential of Interactive Multimedia Instruction (IMI) by providing pre-recorded, high-fidelity source materials for anytime and anywhere delivery. The training begins with expert demonstrations on how to employ sensors using a command and control system that provides automated feedback from virtual simulation. The training advances to

participants performing similar exercises while receiving automated feedback from a training expert and virtual simulation. A learning management system guides the training and participant progress through gated exercises and quizzes modeled on the Conduct of Fire Trainer (COFT). The product also documents lessons learned on combining training theory and technology in order to support training developers, system developers, and decision makers in future Army training efforts.

SR 2007-01
Immersive Simulation Training for the Dismounted Soldier
Bruce W. Knerr. February 2007. (ADA464022)

A study was conducted to document the need for immersive dismounted virtual Soldier and leader training and the available research evidence regarding the effectiveness of virtual training for training Soldiers and leaders in complex skills. A literature search of research reports, journal articles, and conference proceedings to identify evaluations and experiments related to the study topic of the training effectiveness of immersive virtual simulations was conducted. Particular attention was paid to an expended series of evaluations conducted by the Army R&D organizations during the period 1997 – 2005. The major findings are organized around the topics of training effectiveness, Soldier task performance, and advantages and disadvantages of immersive virtual simulations. Soldiers and small unit leaders report that their skills improve as a result of training in virtual simulations, and these self-reports by have generally, if informally, been confirmed by observers. While the simulators impose constraints on the performance of some Soldier activities, this should limit training effectiveness only if those activities that cannot be performed in the simulator are not trained by other means. Advantages and disadvantages of immersive simulations are also described.

SR 2007-02
Increasing the Enlistment Bonus Cap and MOS Channeling Effects
Tirso Diaz, Michael Ingerick, & Paul Sticha. March 2007. (ADA465682)

Faced with a difficult recruiting environment, the Army moved to increase the cap on recruiting bonuses from its current maximum of $20K to $40K. To understand the personnel management implications of raising the bonus cap, the current study estimated its projected impact on Army accessions, specifically applicants' job training and term-of-service (TOS) choices. Using an empirically-based Job Choice Model (JCM), based on actual applicant choice data taken from REQUEST transactions for the first quarter of FY 2005 (n = 18,803), we estimated the model and then simulated applicants' MOS-TOS choices under the existing bonus cap of $20K and a raised bonus cap of $40K. Results of our simulations indicated that the raised bonus cap could increase accessions, particularly among higher quality applicants, to higher priority MOS about 8-10%, on average, and to longer TOS by roughly 12-17%. At the same time, however, accessions to lower priority MOS are projected to drop about 2%. For Army personnel policy researchers, the methodology, estimates and results of the Job Choice Modeling (JCM) could be used in future efforts to model the impact of bonus policy on Army applicants' enlistment behavior.

SR 2007-04
Identifying and Assessing Interaction Knowledges, Skills, and Attributes for Future Force Soldiers
Tim Bowden, Patricia Keenan, Masayu Ramli, & Tonia Heffner. May 2008.
(ADA478702)

Developed in response to a U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) SBIR request, the Army Interpersonal Skills Assessment (AISA) battery consists of five measures designed to evaluate the interpersonal knowledge, skills and attributes (KSA) that will be required of Soldiers in the Future Force. As the Army evolves over the coming years, Soldiers will be placed in positions that require increasing interaction effectiveness. The goal of the AISA is to gauge the Soldier's aptitude to effectively manage interpersonal interactions and to identify Soldiers who may be well suited for positions where effective interpersonal KSAs may improve performance.

In Phase II of this SBIR effort, the AISA battery underwent a full development cycle including focus group reviews by senior Non-Commissioned Officers (NCOs), and pilot and field testing with the target population of first term Soldiers. The final activity in the Phase II effort was a concurrent validation where data were collected from 95 Soldiers and their supervisors in an attempt to determine the predictive ability of the AISA battery. The details of the development activities and the results of the validation effort are the subject of this report.

Study Notes

SN 2007-01
Modeling Army Applicants' Job Choices: The Enlisted Personnel Allocation System (EPAS) Simulation Job Choice Model (JCM)
Tirso Diaz, Michael Ingerick, & Paul Sticha. November 2006. (ADA458765)

To ensure that the EPAS Field Test Simulation provides a realistic and unbiased evaluation of the optimization potential of EPAS, a model simulating Army applicants' job choice decisions is needed. This report summarizes development and evaluation of an empirically-grounded Job Choice Model (JCM), which relates applicants' aptitude scores, demographic characteristics, and job opportunity attributes (including monetary incentives) to their actual choices. As with real-world applicant decisions, it will be possible under the JCM for a given applicant to decide not to join the Army (not access). Similarly, if the applicant elects to join the Army (access), the JCM can simulate the applicant's choice of one of the many MOS reception-station date (job) opportunities from their job list. By sequentially modeling actual applicants' choice behavior, the JCM provides a realistic approximation of applicants' decision-making processes for simulation purposes. Evaluation of the JCM demonstrates that the model effectively simulates applicants' job choice decisions.

SN 2007-02
Army SRB Program: Estimates of Effects on Retention (Revised) and Length of Reenlistment
Flora Tsui, Paul Hogan, Jeff Chandler, Javier Espinosa , Patrick C. Mackin, & Peter M. Greenston. November 2006. (ADA460060)

In this study the effects of Selective Reenlistment Bonuses (SRBs) on Army reenlistments over the 1990-2000 period at Zones A, B, and C at three levels of occupational aggregation – all Army, career management field (CMF), and military occupational specialty (MOS) – were re-estimated to explicitly control for the drawdown in the mid-1990s as well as labor market conditions. In general, the results for Zone A at all levels of occupational aggregation indicate that reenlistment bonuses have a positive and statistically significant effect on Zone A reenlistments. A one-level increase in SRB at Zone A typically increases the reenlistment rate by 3 to 7 percentage points, depending upon the occupation. The results for Zone B are also solid at both the CMF and MOS levels. Results for Zone C, where reenlistment rates are typically very high, were reasonably solid but not quite as good as the Zone A and B results. The results provide the Army with estimates of reenlistment responsiveness to bonus changes for all three zones for all MOS.

We also estimated the effect of SRBs on the reenlisting Soldier's choice of length of reenlistment. Increases in the SRB level not only increase reenlistments, but also increase the length of reenlistment. The length of reenlistment effects were incorporated into the SRB Management System to better predict program costs and the additional staff years of contracted service provided by the bonus program.

SN 2007-03

Econometric Estimates of Army Retention: Zones A, B, C, D and Retirement-Eligible, 1990 – 2004

Carole Moore, Paul Hogan, Christian Kirchner, Patrick Mackin & Peter M. Greenston. January 2007. (ADA464636)

Efficient allocation of reenlistment bonuses requires the ability to estimate the effect that the bonus will have on reenlistments in an occupational specialty. Previous research, conducted in developing the SRB Management System, estimated the effects of SRB on Zone A, B and C reenlistment decisions made between FY1990 and FY2000. In this analysis, we extend the years analyzed to include FY2001 through FY2004. The additional years of data include Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF). We tested the ability of the existing model to predict reenlistment decision-making post-FY2000. To improve fit, we generated new econometric estimates by MOS, CMF and Zone using the more recent years of data, and conducted out-of-sample prediction testing to confirm the validity of the updated model.

SN 2007-04

Updating ARI Educational Benefits Usage Data Bases for Army Regular, Reserve, and Guard: 2005 – 2006

Winnie Young. September 2007. (ADA478062)

This report describes the updating of ARI's educational benefits usage database with Montgomery GI Bill and Army College Fund data for Army Regular, Reserve, and Guard components over the 2005 and 2006 period. For the Regular component, the report includes tabulations of program participation and benefit usage, type of educational program entered, and time between separation and start of education benefits. For Reserve and Guard components, the report includes tabulations by benefit eligibility status, VA training time type, and type of educational program entered. The tabulations are presented by entry cohort, going back to the 1985 entry cohort for all three components.

Research Notes

RN 2007-01
The Relation Between Group-Level Characteristics and Group Cohesion
Mikael Salo. November 2006. (ADA460547)

This research examined the differences in cohesion among platoons in the Finnish conscript service and the relations between platoon cohesion and an array of outcome criteria. Data were collected from records and by questionnaires given to 514 platoon members in 21 platoons near the end of their 6 to 12 months of conscript training. Results showed that mean expected and rated performance, mental state, sense of personal growth, social skills aptitude, attitudes toward refresher training and national defense, and good conduct were related overall to strong platoon mean perceived cohesion. Platoon size was not significantly related to cohesion. The different cohesion components (peer, leader, organizational, and institutional bonding) were related differently to various predictor and outcome variables.

RN 2007-02
The Army Science of Learning Workshop
Kathleen A. Quinkert, John E. Morrison, J. Dexter Fletcher, Franklin L. Moses, & Eric J. Roberts. January 2007. (ADM001922)

At the request of TRADOC, ARI brought together key stakeholders in Army training and education together with experts from academia, industry, and other Military Services for a 3-day workshop. The purpose of this workshop was to identify learning science findings and technologies to help the Army train Soldiers and grow leaders for today and tomorrow. Ninety-five individual workshop participants were divided into four working groups that discussed four distinct problems in training. The following are some of the more notable findings and recommendations from those four working groups: (a) Learning Model—try out an instructional development and execution strategy that is grounded in the science of learning; (b) Develop Leaders—integrate social networks, communities of practice, and Army Knowledge Online (AKO) as an electronic supplement to socialization and relationship building; (c) Train Soldiers—use distance learning (dL) to accelerate training, reduce costs and personnel requirements and to improve operational effectiveness without adversely affecting Soldiers or their families; and (d) Future Capabilities—maintain a robust agenda of multidisciplinary research to include (but not be limited to) the following general topic areas: learning and performance, social and cultural behavior, human-machine performance, predictive models of readiness and performance, and collective performance modeling.

RN 2007-03
Collaboration and Self Assessment: How to Combine 360 Assessments to Increase Self-Understanding
Joseph Psotka, Peter J. Legree, & Dawn M. Gray. March 2007. (ADA467418)

Traditional performance appraisal measures are generally one sided and lack the ability to deliver accurate objective feedback. 360 assessments provide a collaborative

tool for professional development utilizing superior, peer, subordinate, and self assessments to create a more balanced circle of feedback. Traditionally self ratings have been found to be less correlated than peer and superior ratings with performance measures. In general peer and superior ratings are more highly correlated than self and peer, or self and superior. By utilizing an objective measure of tacit leadership knowledge, the TKML, we compared self ratings to peer and superior ratings through a factor score. Given this new measure, correlations with superior and peer ratings were improved. However, subordinate ratings were found to be negligible. Self ratings were found to have a stronger correlation with leadership ability than peer or superior ratings and therefore were found to be the most reliable assessment of leadership ability. Additional regressions combining the 360 ratings yielded the strongest correlations with the TKML. Self appraisals should draw on our knowledge of ourselves and the perspectives that others provide for us.

RN 2007-04
List of U.S. Army Research Institute Research and Technical Publications. Fiscal Year 2007
U.S. Army Research Institute for the Behavioral and Social Sciences. August 2007. (ADA472092)

ARI publishes lists of its technical and research publications as a convenient reference for qualified agencies and individuals and sponsors, This issue of the publication list describes reports published during the period October 1, 2006, to September 30, 2007. It contains the abstract of each publication and the bibliographic information needed to identify a publication. The abstracts have been written, as far as possible, to describe the principal research findings in non-technical terms; however, technical language is used to communicate efficiently the details of research analysis. Author and subject indexing provide access to individual reports and topics.

RN 2007-05
SamePage: Development of a Team Training Tool to Promote Shared Understanding
V. Alan Spiker, Eric W. Holder, Wayne F. Walls, William M. Campsey, & Philip D. Bruce
July 2007. (ADA470896)

This research note describes the work conducted under a Phase II SBIR contract in which an online team training system called SamePage was created. The goal of SamePage is to promote the development of knowledge and skills for enhancing shared understanding within a team. The training begins with individualized online training designed to help trainees learn about shared understanding concepts. Once trainees have been exposed to basic principles of shared understanding, they work together as a five-person team through an online scenario-based exercise to practice the principles learned during individualized instruction. The scenario exercise is periodically halted so that an instructor can bring the group together into roundtable discussions to talk about team processes and shared understanding concepts. Portions of SamePage were tested in a formative evaluation with battalion-level staff, and reactions to the system

were generally positive. Six lessons learned about constructing online team-based training are presented in the last section of this note.

RN 2007-06
Annotated Bibliography: Research on Enlisted Attrition in the U.S. Army
Elyse Jennings, & Nehama Babin. July 2007. (ADA470816)

The purpose of this annotated bibliography is to provide a resource for the study of Soldier attrition, with a focus on the Active enlisted component of the U.S. Army. These annotations include descriptions of the published literature on attrition from 1980 through the present. This annotated bibliography is intended to gather the many research efforts that have been conducted over the years into a single source. This source may provide a base for those who are continuing ongoing research or are beginning new attrition research. It can be used as an overview of methods and statistics utilized over the years, or a summary of the findings and results of the many pieces of research.

The primary focus of this bibliography is on enlisted attrition in the Active component of the U.S. Army. Bibliographic references to research or literature on the Army Officer Corps and the Reserve Component (including the Army National Guard) were not included. Each component of the Army has its own unique structure, standard, and policies, and therefore, it cannot necessarily be assumed that attrition models of one component are easily transferable to or generalized to another. Furthermore, each component of the Army has its own set of complexities that make generalization risky.

RN 2007-07
Training Exemplars for Visualizing Time and Space at Company and Platoon Level
Jason Sidman, & Mike Garrity. August 2007. (ADM002032)

Success in military operations increasingly rests on the ability of small units to counter asymmetric threats in the varied and foreign urban settings that typify the contemporary operating environment. However, the physical dimensions and cultural characteristics of urban environments dramatically compress and complicate the dynamics of space and time so fundamental to visualizing and executing company and platoon operations. A cognitive task analysis (CTA) was conducted to identify training requirements for limited prototype training development. The CTA underscored the need for visualization training in small units and identified a related set of training principles and associated techniques. On that basis, prototype examples of visualization training were developed in five modules that feature scenario-based contexts, multimedia delivery, and deliberate practice. The prototype training examples are provided to guide future development of visualization training at the small unit level.

RN 2007-08
Heuristic Evaluation of a User Interface for a Game-Based Simulation
Christian J. Jerome, Amanda Howey, & Deborah R. Billings. September 2007.
(ADA475400)

This research sought to estimate the level of usability, to identify any problem areas, and to provide redesign recommendations that may improve the usability of future designs of Forterra's Online Interactive Virtual Environment (OLIVE) system as a training tool. Game interface usability might have an effect on the success of game-based simulation training programs. Three usability researchers performed a usability heuristic evaluation, documenting each problem identified, as well as the recommended solution to these problems. Three areas out of the ten usability heuristics were identified as potentially problematic: *User Control and Freedom Recognition, Recognition Rather than Recall,* and *Help and Documentation.* A number of design recommendations have been identified which should improve usability and task performance using these systems. The data can serve to enhance the existing software by incorporating additional program requirements, and can also provide an easy-to-use checklist for DoD personnel, private contractors, and researchers interested in the design and testing of game-based simulation for team training.

Contractor Reports[*]

[*]These are additional reports submitted by contractors which are not listed in the previous categories

CR 2007-03
Adaptive Role-Play Exercises for a Leader Development Center
Michael Hertz. November 2006. (ADA460360)

This report describes work performed under a Phase I Small Business Innovation Research Contract. This report describes two research and development activities. One effort was the creation of a plan for the development of a Leader Development Center. Progeny Systems proposed to create a simulation or scenario-driven computer-based assessment of an individual's leadership performance. In order to create this computer-based assessment solution, the relevant literature had to be reviewed to develop the theoretical framework for the proof of concept solution. The other significant effort was the creation of a system to deliver content, capture user responses, and report results out to an external system. This Simulation Delivery System was created using XML, web services and the .Net 2.0 framework to minimize the client-side code and keep as much processing and functionality on the web server as possible. Moving the functionality out of the Simulation Environment also granted flexibility in which Simulation Engine could be used. These web services were further split into three different, but complementary functions, Get Leadership Data, Get Simulation Parameters, and Store Leadership Simulation Results.

CR 2007-04
Training a Joint and Expeditionary Mindset
Ellen Menaker, Jo MacDonald, Arnold Hendrick, & Debra O'Conner. December 2006. (ADA460138)

The purpose of this research was to design a computer-mediated training environment to help ground-component forces develop the cognitive and affective skills needed to meet the challenges of engaging as a Joint and Expeditionary force. These skills are critical for effective performance of Combat Arms, Combat Support, Combat Service Support, and Reserve and National Guard components in the new operational environment. Qualitative analysis methods, including an extensive literature review, document review, and interviews with experienced joint forces troops were used to identify the constructs required for developing a Joint and Expeditionary Mindset (JEM). The investigation resulted in a multiphase process for identifying the required JEM skills and performance indicators associated with the JEM constructs and for using them to create effective computer-mediated training scenarios. The pedagogic model enables development of scenarios that challenge Soldiers in cognitive, affective, metacognitive, and moral dimensions. The scenario design blueprint specifies the skills, indicators, and measures to be scripted in the scenarios. Two proof- of -concept scenarios were developed based on this model and blueprint methodology. The resulting scenarios

were demonstrated for an academic military audience. Results indicated the viability of this approach.

CR 2007-05
An Analysis of a Joint and Expeditionary Mindset
William J. Walsh, & Clark A. Shingledecker. December 2006. (ADA460068)

This report was developed under the Small Business Innovative Research Program, Phase I. The goal of the research was to identify cognitive readiness skills necessary for ground component forces to deploy anywhere in the world on short notice, and the meta-cognitive awareness necessary to be adaptable and learn quickly in an unknown culture. The authors found that Joint refers to a major shift toward blending the doctrine, language, and cultures of the Service branches to enable effective interoperability. Expeditionary means being rapidly deployable, self-sustainable, with the ability to reconstitute rapidly in theatre and assume further mission taskings. Soldiers must have the capability of being effective while operating in a zone of discomfort and making decisions in ambiguous environments. Working with the Center for Army Leadership, the authors narrowed the focus to providing Army Transition Teams with the wherewithal to more efficiently perform their difficult task advising fledgling security forces to achieve self-sustainability. Seven critical issues were identified contributing to the concepts discussed: culture shock, stress, role shock, dealing with foreign nationals, negotiating skills, Service component differences, and cross-culture communication skills.

CR 2007-06
Computer-Mediated Training Tools to Enhance Joint Task Force Cognitive Leadership Skills
Igor Linkov, George Fenton, F. Kyle Satterstrom, Ryland Gaskins, & Barclay Lewis
April 2007. (ADA465397)

This project describes a computer-mediated cognitive leadership training program for helping leaders of a Joint Task Force overcome cultural barriers between services. The program focuses on the brigade level (and higher) echelons of service warfighting units, and it is intended as a supplement to intermediate-level formal service schools. The training environment features a user-friendly interface based on the Decisive Action platform, which provides a controlled environment for leadership skill training. The proposed scenario places the participant in a crisis situation as the commanding officer of a Joint Force operation. A crisis situation requires information from a wide range of information sources and categories, and the trainee, as the commander, must assess the situation with the information provided. The trainees are assessed on how well they adapt to unforeseen circumstances that are introduced during the course of the experiment.

CR 2007-07
Virtual Observer Controller (VOC) for Small Unit Infantry Leader Simulation Training
H. George Banta, David B. Troillet, Jason Patrick Daly, & Glenn Andrew Martin
April 2007. (ADA469326)

This report was developed under a Small Business Technology Transfer Research (STTR) Phase II contract. It describes the development of a prototype Virtual Observer/Controller (VOC) to observe the performance of and offer limited feedback to small-unit, dismounted Infantry Soldiers while training with the Soldier Visualization System (SVS). The successful integration of technologies paved the way for SVS exercises that were not completely dependent on a human observer/controller. The development and implementation of the prototype VOC required several major efforts: (a) identifying the Soldier behaviors that merit performance evaluations, (b) developing situation triggers in the context of a training scenario that stimulate the Soldier behaviors that will be observed and evaluated, (c) determining how to detect those behaviors in an automated fashion, and (d) developing instructional strategies that can adequately respond to both individual actions and small-unit collective behaviors.

CR 2007-10
The Leadership Formula: P*M*D
Micha Popper, Karin Amit, Reuvan Gal, Moran Mishkal-Sinai, & Alon Lisak
August 2007. (ADA472601)

Three factors, potential (P), motivation (M), and development (D) constitute the frame of reference proposed in this research for leadership development: P x M x D. The three factors are presented here in an interactive (multiplicative), rather than an additive relationship because of our prior assumption that if one of the factors is absent (or has zero value), the product of the multiplication will be zero, namely no leadership. This assumption has yet to be examined empirically, although it has been raised in the past on the basis of common sense. On the other hand, it may be argued that while one or two of the components (almost certainly potential and motivation) are essential for leadership, the third (development) is possible and additive, but not essential. This, then, is the aim of the present research: to examine the nature of the relationship between the three components. At the same time, the research assumption is that all three components are required in the leadership process and that the absence of one of them will invalidate the equation, in other words, will not produce effective leadership.

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Abbreviations

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RR	Research Report	SN	Study Note
RP	Research Product	RN	Research Note
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FY 2007 Book and Book Chapters

Legree, P. J., Psotka, J., Tremble, T., & Bourne, D. (2006). Die Verwendung konsensbasierter messverfahren zur erfassung emotionaler intelligenz. In R. Schulze & R. D. Roberts (EDs.), *Emotionale Intelligenz: Ein vInternationales Handbuch* (pp 165-190). Berlin, Germany: Hogrefe & Huber.

Orvis, K.A., Orvis, K.L., Belanich, J., & Mullin, L.N. (2007). The influence of trainee gaming experience on affective and motivational learner outcomes of videogame-based training environments. In H. O'Neil & R. Perez (Eds.), *Computer Games and Team and Individual Learning* (pp. 125-143), Amsterdam: Elsevier.

Salas, E., Wilson, K.A., Burke, C.S. Wightman, D.C., and Howse, W.R. (2006). Crew resource management training research, practice, and lessons learned and needs. In R.C. Williges (Ed.) *Review of Human Factors and Ergonomics Vol 2*. Santa Monica, CA: Human Factors and Ergonomics Society.

Salo, M., & Siebold, G. L. (2007). The structure of military cohesion: Components, predictors, and outcomes. In H. Annen and W. Royl (Vol. Eds.), *Military Pedagogy in Progress, 10,* 213-224, Studies for Military Pedagogy, Military Science & Security Policy. Frankfurt am Main, Germany: Peter Lang.

Streeter, L. A., Lochbaum, K. E., LaVoie, N., & Psotka, J. (2007). Automated Tools for Collaborative Learning Environments. In T. Landauer, D.S. McNamara, S. Dennis, & W. Kintsch (Eds.), *LSA: A Road to Meaning* (pp. 279-290). Mahwah, NJ: Erlbaum.

Wilson, K.A., Guthrie, J.W., Salas, E. and Howse, W.R. (2008). Team processes and their training in aviation: An update. In J.A. Wise, V.D. Hopkin, and D.J. Garland (Eds.), *Handbook of Aviation Human Factors (2nd Edition)*. Hillsdale, NJ, LEA.

FY 2007 Journal Articles

Barnett, J.S. (2007). How Training Affects Soldier Attitudes and Behaviors Toward Digital Command and Control Systems. *Military Psychology*, 90(1) 45-59.

Birnholtz, J. P., and Horn D. B., (2007). Shake, rattle and roles: Lessons from experimental earthquake engineering for incorporating remote users in large-scale e-science experiments. *Journal of Computer-Mediated Communication, 12*(2), article 17.

Burke, C.S. & Goodwin, G.F. (2007, April). Shared cognition: Delving into metrics. *Proceedings of the 22nd Annual Conference for the Society for Industrial and Organizational Psychology, New York, NY.*

Cracraft, M., Wisecarver, M., Baggett, M., & Miller, T. (2006). Self-awareness: Getting the ground truth from peer evaluations. *Special Warfare, 19(6)*, 23-26.

Johnson, D. M. (2007). Helicopter simulator sickness: Age, experience, and amount learned. *International Journal of Applied Aviation Studies, 7(2)*, 178-201.

Legree, P. J., & Psotka, J. (2006*). Refining Situational Judgment Test Methods. *Proceedings of the 2006 Army Science Conference, Orlando, FL.*

Martin, D., Wiley, D., & Legree, P.J. (2007). Ethnocentrism and Internal Compensation Structuring: An Experimental Examination of Point Factor Job Evaluation. *Western Journal of Human Resource Management*, CD-ROM.

Mueller-Hanson, R., Wisecarver, M., Baggett, M., Miller, T., & Mendini, K. (2007). Developing adaptive leaders. *Special Warfare*, 20(4), 28-32.

Salas, E., Rosen, M.A., Burke, S.C., Nicholson, D. and Howse, W.R. (2007). Markers for enhancing team cognition in complex environments: The power of team performance diagnosis. *Aviation, Space and Environmental Medicine; 78* (5), B77-B85.

Siebold, G. L. (2006). [Review of the book *Dereliction of Duty*, Lt. Col. Robert "Buzz" Patterson, USAF (Ret.), Washington, DC: Regnery Publishing, 2003]. *Armed Forces and Society, 32*(2), 333-335.

Siebold, G. L. (2007). The essence of military group cohesion. *Armed Forces and Society, 33*(2), 286-295. (Commentary)

Singer, M.J. & Kusumoto, L. (2006, October). Developmental evaluation of a distributed online Simulation. *Proceedings of the Human Factors & Ergonometics Society 50th Annual Meeting, San Francisco, CA*, CD-ROM, 2669-2672.

Van Iddekinge, C. H., Sager, C. E., Burnfield, J. L., & Heffner, T. S.(2006). The Variability of Criterion-Related Validity Estimates Among Interviewers and Interview Panels. *International Journal of Selection and Assessment, 14*, 193-205.

Wisecarver, M.M., Carpenter, T.D., & Kilcullen, R.N. (2007). Capturing interpersonal performance in a latent performance model. *Military Psychology,19*(2), 83-101.

Barnett, J.S., & Ross, J. (2007). *Effect of Audio-Visual Cues on Situation Awareness and Workload in a Net-Centric Warfare Scenario.* Paper presented at the Human Factors and Ergonomics Society 50th Annual Meeting, San Francisco, CA.

Beaubien, J. M., Shadrick, S. B., Paley, M., Badugu, S., Ennis, C. W., & Jacklin, S. (2006, December). *Using deliberate practice to train military-civilian interagency coordination.* Paper presented at the Annual Interservice/Industry Training, Simulation & Education Conference (I/ITSEC), Orlando, FL.

Belanich, J., Orvis, K. A., & Horn, D. B. (2007, September). *Developing videogame-based training: empirical research supporting instruction.* Paper presented at the Air Force Research Laboratory's workshop titled, "Enhancing Human Performance and Learning", Mesa, AZ

Belanich, J., Orvis, K. A., Moore, J., Horn, D. B., & Solberg, J. L. (2007, December). *Fact or Fiction - Soldiers are Gamers: Potential Effects on Training.* Paper presented at the Annual Interservice/Industry Training, Simulation & Education Conference (I/ITSEC), Orlando, FL. Best Paper Honorable Mention.

Ben-Yoav, Nobel, O., Wortinger, B. & D. Fuchs (2006). *Solider-Negotiator: The Impact of Perceived Iraqis' Power and Trust on the Negotiation between US Military Officers and Iraqi Civilians.* Paper presented at the American Psychological Association (APA) Division 19/21 Midyear Symposium on Applied Experimental Research, Fairfax, VA.

Ben-Yoav Nobel, O., Wortinger, B., Campbell, D. (2006, November). *Winning hearts and minds: Role ambiguity and Soldiers' negotiations with members of the local population.* Paper presented at the Israel Defense Force Military Psychology Center meeting, Israel.

Botsford, W., and Wisecarver, M. (2007). *Defining the Foundation of Effective Interpersonal Performance.* Paper presented in a symposium at the Annual Conference of the Society of Industrial/Organizational Psychology.

Burke, C.S., Goodwin, G.F., Burke, B., & Bryson, J. (2007, April). A conceptual examination of the who, what and how of shared cognition. In C.S. Burke & G.F. Goodwin (Chairs), *Shared cognition: Delving into metrics.* Symposium conducted at the Annual Society for Industrial Organizational Psychology Conference, New York, NY.

Burke, C.S. & Goodwin, G.F. (2007, April). *Shared cognition: Delving into metrics.* Symposium conducted at the Annual Society for Industrial Organizational Psychology, New York, NY.

Conjar, E. A. (2007, March). *The impact of task and relationship conflict on team structure. In Motivation and Work Attitudes.* Symposium conducted at the 2007 IO/OB Conference, Indianapolis, IN. Robert J. Wherry Best Paper Award Winner, 2007 IO/OB Conference (September, 2007).

Durlach, P. & Neumann, J. (2007, May). *Effect of Input Control Device on Performance During Training To Operate a Simulated Micro Aerial Vehicle.* Paper presented at the Fourth Annual Human Factors of UAVs Workshop, Chandler, AZ.

Durlach. P. (2007, May). *PACERS: Platoon Aid for Collective Employment of Robotic Systems.* Paper presented at the Fourth Annual Human Factors of UAVs Workshop, Chandler, AZ.

Dyer, J. L., & Tucker, J. S. (2007, March). *Training Ground Forces on a Computerized Soldier System: Lessons from the Field.* Paper presented at the American Psychological Association (APA) Division 19/21 Midyear Symposium on Applied Experimental Research, Fairfax, VA.

Goodwin, G. F. (2007, April). *Swimming in global waters: Integrating culture into interpersonal performance.* Symposium conducted at the Annual Meeting of the Society for Industrial/Organizational Psychology, New York, NY.

Gray, D.M., Psotka, J., & Legree, P.J. (2007, March). *Collaborating and self assessment: How to combine 360 assessments to increase self-understanding.* Paper presented at the American Psychological Association (APA) Division 19/21 Midyear Symposium on Applied Experimental Research, Fairfax, VA.

Heffner, T. S. (2007, May). *The Army's Tier Two Attrition Screen (TTAS).* Paper presented at The Technical Cooperation Program, Human Resources and Performance Group, Selection and Classification Panel Annual Meeting, Monterey, CA.

Heffner, T. S. (2007, May). *Strategies to Enhance Retention (STAY).* Paper presented at The Technical Cooperation Program, Human Resources and Performance Group, Selection and Classification Panel Annual Meeting, Monterey, CA.

Heffner, T. S. (2007, May). *Validating Future Force Performance Measures (Army Class).* Paper presented at The Technical Cooperation Program, Human Resources and Performance Group, Selection and Classification Panel Annual Meeting, Monterey, CA.

Hill, R. W., Kim, J. M., Zbylut, M. L., Gordon, A. S., Traum, D., Gandhe, S., King, S., Lavis, S., & Rocher, S. (2006, November). *AXL.net: Web-enabled case method instruction for accelerating tacit knowledge acquisition in leaders.* Paper presented at the 25th Army Science Conference, Orlando, FL.

Horn, D. B. (2007). *Research at the US Army Research Institute for the Behavioral and Social Sciences.* Invited panel presentation at the American Psychological Association (APA) Division 19/21 Midyear Symposium on Applied Experimental Research, Fairfax, VA.

Horn, D. B., Belanich, J. B., & Orvis, K. A. (2007). *Game and Gamer Characteristics: Implications for Training.* Paper presented at the 13th Annual Cyber Therapy Conference, Washington, DC.

Johnson, D.M. (2007). *Simulator Sickness Research Summary.* Presented to the AMVE-Technology Task Group. Published in RTO-TR-HFM-121, Part 2, Human Factors Considerations in the Design, Use, and Evaluation of AMVE-Technology, Paper 5, p1-28.

Katz, L.C. (2006, November). *Finding the "Right Stuff": Development of the Selection Instrument for Flight Training (SIFT).* Department of Defense Human Factors Engineering Technical Advisory Group Meeting 56, Monterey, CA.

Katz, L.C. (2007, March). *Finding the "Right Stuff": Development of an Army Aviator Selection Instrument.* Proceedings of the 25th Army Science Conference, Orlando,FL.

Kim, J., Hill, R., & Zbylut, M. (2007, July). *Film-based Cases in Interactive Learning Environments for Leaders.* Paper presented at the 13th Annual International Conference on Artificial Intelligence in Education, Marina del Rey, CA.

Lampton, D.R., Riley, J., Kaber, D. , Nainar, M., & Endsley, M. (2006, November). *Use of Virtual Environments for Measuring and Training Situation Awareness.* Paper presented at the 25th Army Science Conference, Orlando, FL.

Martin, D. M., Wiley, D., & Legree P. J. (2006). *Ethnocentrism and Internal Compensation Structuring: An Experimental Examination of Point Factor Job Evaluation.* Paper presented at the 2006 Western Business and Management Conference.

Martin, D. M., Moore, C. & Legree P. J. (2007, June). *Personnel Selection: An Application of the Unobtrusive Knowledge Test.* Paper presented at the 10th International Conference of American Society of Business and Behavioral Sciences (ASBBS), Honolulu, Hawaii.

Meliza, L.L. & Barnett, J.S. (2006, October). *Tailoring an Information Flow Model to Trainee Level of Proficiency.* Paper presented at the International Military Testing Association (IMTA) annual conference, Kingston, Ontario, Canada.

Moore, J., Orvis, K., Belanich, J., Solberg, J., & Horn, D. (2007, March). *Who plays what? Videogame usage among Soldiers and potential training effects.* Paper presented at the American Psychological Association (APA) Division 19/21 Midyear Symposium on Applied Experimental Research, Fairfax, VA.

Rentsch, J. R., Gundersen, A., Abbe, A., & Gulick, L. (2007, April). Multicultural Perspective Taking Competencies. In (G.F. Goodwin, Chair) *Swimming in global waters: Integrating culture into interpersonal performance.* Symposium conducted at the Annual Society for Industrial Organizational Psychology Conference, New York, NY.

Sanders, W. R. (2007, May). *Developing benchmark measures for collaborative planning performance.* Paper presented at the Department of Defense Human Factors Engineering Technical Advisory Group Conference, Portsmouth, VA.

Schaab, B (2007, May). *Cultural Characteristics that Could Influence Collaboration.* Paper presented at Human Factors and Engineering Technical Advisory Group, Portsmouth, VA

Schaab, B. (2007, June). *Cohesion in a Multinational Coalition Center.* Paper presented at the 12th ICCRTS conference, Newport, RI.

Schaefer, P., & Shadrick, S. (2007, March). *Content validation of crisis management training for civilian /government agencies.* Paper presented at the American Psychological Association (APA) Division 19/21 Midyear Symposium on Applied Experimental Research, Fairfax, VA.

Schneider, R. J., Johnson, J. W., & Legree, P. J. (2006, May). *Do SJTs measure the same construct above and below the median?* Paper presented at the American Psychology Society for Industrial and Organizational Psychology (SIOP) Conference, Dallas, TX.

Shadrick, S. B., Lussier, J. W., & Wilson, G. (2006, December). *Realistic methods for automated coaching.* Paper presented at the Annual Interservice/Industry Training, Simulation & Education Conference (I/ITSEC), Orlando, FL.

Solberg, J. (2007, April). *Training Night Vision Goggle Use in a Game-Based Environment.* Paper presented at the NATO HFM Panel for Human Factors And Medical Aspects of Day/Night All Weather Operations: Current Issues and Future Challenges, Heraklion, Greece.

Stewart, J.E. II (2007, May). *The Aviation Psychologist as Change Agent: ARI's Collaborative Efforts that Change the Way the Army Trains.* Paper presented at the Human Factors and Engineering Technical Advisory Group Meeting 57, Portsmouth, MA.

Taylor, T. Z., & Siebold, G. L. (2006, October). *Cohesion and soldier career intentions over time.* Paper presented at the 48th Annual Meeting of the International Military Testing Association, Kingston, Ontario, Canada.

Tucker, J. S., & Gunther, K. M. (2007, February). *Applying a Model of Adaptive Performance to Army Leader Behaviors.* Paper presented at the Annual Meeting of the Southeastern Psychological Association. New Orleans, LA. (Nominated for the SEPA Outstanding Professional Paper Award)

Wesolek, M.L. (2007, May). *Flight School XXI Training Effectiveness Analysis.* Paper presented at the Human Factors and Engineering Technical Advisory Group Meeting 57, Portsmouth, MA.

Zbylut, M. L., & Reichard, R. J. (2007, April). *Leadership during crisis: A multilevel look across levels of crisis and time.* Paper presented at the Annual meeting of the Society of Industrial/Organizational Psychology, New York, NY.

Zbylut, M. L., Mark, J. D., & Vowels, C. (2006, August). *Challenges and approaches to evaluating a leadership intervention for Army officers.* Paper presented at the Annual Academy of Management Conference, Atlanta, GA.

FY 2007 Poster Sessions

Barba, C., Deaton, J. E., Santorelli, T., Knerr, B., Singer, M., & Belanich, J. (2006, November). *Virtual environment composable training for operational readiness (VECTOR).* Poster session presented at the 25th Army Science Conference, Orlando, FL.

Conjar, E. A., & Horn, D. (2008, April). Formal and Emergent Leaders' Cognitive Accuracy in Social Networks. Poster session presented at the 23rd annual meeting of the Society for Industrial and Organizational Psychology, San Francisco, CA. John C. Flanagan Best Student Paper Award Winner, 2008 SIOP Conference.

Crabb, B. T., Hunt, S. A., & Dillman, K. G. (2006, November). *Involuntary aware memory affects production tests more than it does identification tests.* Poster session presented at the Annual Meeting of the Psychonomic Society, Houston, TX.

Hall, B. T., Johnson, B. N., & Bink, M. L. (2007, May). *Collaborating Lowers Rates of Unconscious Plagiarism.* Poster session presented at the Nineteenth Annual American Psychological Society Convention, Washington, DC.

Hill, R. W., Lane, H. C., Core, M., Forbell, E., Kim, J., Belanich, J., Dixon, M., & Hart, J. (2006). *Pedagogically structured game-based training: development of the ELECT BiLAT simulation.* Poster session presented at the 25th Army Science Conference, Orlando, FL.

Hoffman III, R.R. & Muraca, S.T. (2007, August). *Cognitive and Non-Cognitive Predictors of Basic Combat Training Performance and Attitudes.* Poster session presented at the American Psychological Association 19th Annual Convention, Washington, DC.

Howard, C.R. (2007, May). *A Tripartite Competence Model for People with Serious Mental Illness.* Poster session presented at the American Psychological Society 19th Annual Convention, Washington, DC.

Jerome, C.J., Witmer, B., & Mouloua, M. (2006, October). *Attention orienting in augmented reality environments: Effects of multimodal cues.* Poster session presented at the Human Factors & Ergonomics Society 50th Annual Meeting, San Francisco, CA.

Johnson, B. N., Hall, B. T., & Bink, M. L. (2007, May). *Group Production Manipulations Influence Decision Criteria in Group Brainstorming.* Poster session presented at the American Psychological Society 19th Annual Convention, Washington, DC.

Klein, C., Stagl, K., Salas, E., Burke, C.S., Diaz Granados, D., Goodwin, G.F, & Halpin, S.M. (2007, April). *A Meta-Analytic Examination of Team Development Interventions.* Poster session presented at the annual Society for Industrial Organizational Psychology Conference. New York, NY.

Moore, J. Karin Orvis, K., Belanich, J. Solberg, J., & Horn, F. (2007, March). *Who Plays What? Videogame Usage Among Soldiers and Potential Training Effects.* Poster session presented at the Annual American Psychological Association (APA) Division 19/21 Midyear Symposium, Fairfax, VA.

Orvis, K. A., Horn, D. B., & Belanich, J. (2007, August). *The roles of task difficulty and Prior videogame experience on performance and motivation in instructional videogames.* Poster session presented at the 19th Annual Conference of the Association for Psychological Science, Washington, DC.

Owens, K., Knapp, D., Ingerick, M., Diaz, T., and Putka, D. (2007, August). *Estimating the Classification Potential of Army Non-Cognitive Measures.* Poster session presented at the 115th Annual Convention of the American Psychological Association, San Francisco, CA.

Psotka, J., Legree, P., & Gray, D. (2007, March). *Self-awareness and 360 degree assessment.* Poster session presented at the Annual American Psychological Association (APA) Division 19/21 Midyear Symposium, Fairfax, VA

Ross, J. M., Barnett, J. S. & Meliza, L. L. (2007, October). *Effect of audio-visual alerts on situation awareness and workload in a net-centric warfare scenario.* Poster session presented at the 51st annual meeting of the Human Factors and Ergonomics Society, Baltimore, Maryland.

Schaab, B., & Harris, B. (2006, November). *Influence of Bogus Intelligence Reports on Confidence in Subsequent Reports.* Poster session presented at the 25th Army Science Conference, Orlando, FL.

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ARI publishes lists of its technical and research publications as a convenient reference for qualified agencies and individuals and sponsors. This issue of the publication list describes reports approved for public release during the period October 1, 2006, to September 30, 2007. It contains the abstract of each publication and the bibliographic information needed to identify a publication. The abstracts have been written, as far as possible, to describe the principal research findings in non-technical terms; however, technical language is used to communicate efficiently the details of research analysis. Author and subject indexing provide access to individual reports and topics.

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